JOURNAL

OF THE

BRITISH SOCIETY OF DOWSERS

Vol. III. No. 24 June, 1939

CONTENTS

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BRITISH SOCIETY OF DOWSERS

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OBJECTS OF THE SOCIETY

(*a*) To encourage the study of all matters connected with the perception of radiation by the human organism with or without an instrument.

(*b*) To spread information amongst members, by means of a journal, lectures and other means, about the use of dowsing for geophysical, medical and agricultural and other purposes and for tracing objects animate or inanimate.

(*c*) To keep a register of dowsers for water, minerals, oil, and for other purposes.

RULES OF THE SOCIETY

I.—Membership.

The Society is open to all persons interested in radiation-perception.

The Council has power to appoint honorary members.

II.—Subscription.

The subscription is five shillings per annum, or three guineas for a life member.

III.—Management.

The Society will be managed by a Council consisting of a President, who will act as Chairman, and five members, one of whom will act as Treasurer and Secretary.

The President and members will be replaced as necessary by the Council, appointments being confirmed at a General Meeting.

All questions regarding the publication of the journal, lectures, meetings, etc., will be settled by the Council.

Decisions of the Council will be arrived at by correspondence if necessary, the facts being recorded in the Minute Book.

Decisions will be decided by a majority vote, the Chairman having a casting vote.

The Council has power to co-opt other members for special purposes.

IV.— Accounts.

The financial year will be from July 1st to June 30th.

Accounts will be published annually within two months after the end of the financial year.

Accounts will be audited privately.

V.—General Meeting.

A General Meeting will be held annually, and other meetings when considered necessary by the Council.

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NOTICES

A paper, printed below, on Archæological Dowsing, was read by Mr. Reginald A. Smith, F.S.A., at the rooms of the Royal Asiatic Society on February 15th, and a lecture was given at the same place on March 16th by Mr. A. Noel Spong on "My Experiences as a Water Diviner."

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A book, to be called "The Physics of the Divining Rod," by Mr. J. Cecil Maby (B.S.D.) and Mr. T. Bedford Franklin (B.S.D.), is shortly to be published by G. Bell and Sons. It embodies an account of the investigations on the physical origin of "dowsing," which the authors have been carrying out during the last few years.

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Mumetal rods can now be obtained through the Editor at the reduced price of £1 10s. An article on the use of the mumetal rod for depth finding, which was discovered by the late Major Ralph Creyke, was reprinted in the Journal for March, 1939.

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Several members have asked the Editor for back numbers of the Journal. The Editor would be greatly obliged if members who do not require their old Journals would return them to him.

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Angle rods with swivel handle can be obtained from Messrs. Windley Bros., Crown Works, Chelmsford, for 6s. 6d., post free to any address in England.

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Messrs. Devine and Co., St. Stephen's Road, Old Ford, London, E.3, supply pendulums of whale ivory, with central suspension and cavity for sample, at the price of 6s., and other dowsing instruments.

They also supply whalebone for rods cut to size.

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Pendulums of rosewood can be obtained from the Hon. Secretary at 3s. each, and the Society's badges at 1s.

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Communications for the Editor, and inquiries, should be sent to Colonel A. H. Bell, York House, Portugal Street, London, W.C.2.

THE RADIAL DETECTOR

By A. A. COOK

I can agree on most points raised by "Auber" in his interesting article on "Inhibitions" (*B.S.D.J.*, Vol. III., 23, page 324), but from my experience cannot support the statement that obstacles can be raised by one's own mind, viz.: "Imagine an obstacle and it will prove an obstacle." This would be, of course, auto-suggestion, and I have given an example (*B.S.D.J.*, Vol. III., 23, page 322) that this does not apply, as far as I am concerned, in using the rod. On the authority of M. Henri Mager, which is in accord with my experience, the pendulum "is an amiable instrument. It accommodates itself to men's wants. It does not refuse to follow the thoughts of the operator, but the divining rod in competent hands refuses all such compliance."

Not wishing to be dogmatic, but judging by my experience with diviners whom I have had an opportunity to test, I do not believe there are any inhibitions, if all facts are taken into consideration and all diviners would comply with the same conditions when working. Some who use the whalebone detector connected at the end with a piece of red rubber tubing say there is an inhibition to their picking up a ray which works an ordinary wooden detector. The inhibition is not there, as is proved when the red point of the whalebone detector is removed and the whalebone shafts connected by ordinary twine. The seeming inhibition was caused by the point of the detector being red. The base of the radial detector's action appears to be a ray or wave which uses the left side of the operator to come to the detector and which returns to earth by the operator's right side. To the operator of the detector there must always be a connection to the earth by contact or per electric or magnetic wave, from the object being divined. Without this, the detector *may* be influenced by something, but in my experience, *not* by the object which is not so connected. The action of the ray is in accordance with Nature's laws, and I am of the opinion, from my many experimental tests, that this action always works on the same basis, as the laws of Nature always do. Inhibitions caused by any insulating material such as glass, china, rubber, paper, &c., which are proved non-conductors, are basic facts. If a diviner seemingly gets a detector action from material so insulated (and without an electric or magnetic wave) he, actually, is not getting the radiation from the object so treated. He is experiencing a movement of the detector from *some* cause, but *not* from the insulated object.

In a newspaper lately a photograph was given of a diviner "demonstrating the divining rod over a jar of crude oil." He

was shown holding a rod with a china bowl which held the oil at his feet. As china would insulate the oil, he was not getting any influence from it, and his rod would have worked equally as well had the bowl of oil been removed. If the oil in the bowl had been connected with the earth, his rod would not have worked. The cause of this contradiction was the colours and metals he carried on his person. Here again I have to emphasize that the diviner, for correct working, must have no metals, colours, &c., on his person, and, in some tests, if gold or any other filling in his teeth, this filling must be short circuited from his body.

Dowsing from horseback, motor-car, railway coach and aeroplane can be successfully carried out, because they are all connected with the earth, actually, in the first three cases, and per electric wave in the fourth. The following example explains: Insulate a motor-car from the earth by running each wheel on to a thick pad of paper or other insulating material. With engine not working endeavour to get the radiation from a person seated in the car. This will be found impossible. With the car still stationary on the paper pads, start up the engine. Now the detector works on the person's radiation fast or slow, as the engine is speeded up or slowed down. Another example of an electrical influence. A radio is being used in a dwelling. Walking outside the dwelling and holding the radial detector, as if in search of water, when one gets in direct line with the transmitting station and the radio receiver, the detector will work over what appears to be the ray or wave going to the radio receiver. This also applies if one walks to the other side of the dwelling and gets the transmitting station and the radio receiver in direct line. Walk along this ray away from the transmitting station and the detector remains down. Walk towards the transmitting station, and the detector works up and down as it does when one walks "up" stream on underground water.

I have lately had to have some treatment with radium, and find that since the treatment I am unable to get the detector to operate unless I short circuit the radium which my body contains. My doctor tells me the radium will take about six weeks to work out, and I am keeping records to check up on his statement.

ARCHÆOLOGICAL DOWSING

[A Lecture delivered to the British Society of Dowsers on February 15th, 1939, by Mr. Reginald A. Smith]

Before an audience of practising dowsers it is unnecessary to insist on the existence of radiations or the possibility of perceiving them by rod and pendulum; and any alleged discovery of a deep spring or socket of a standing-stone will be given the benefit of the doubt, not that any observer is infallible, but because a competent dowser could test the discovery independently once a clue to the locality is given. The President's invitation to lecture on the application of this method to archæology is accepted on this understanding, and a year's work is shewn in a series of lantern slides made for the occasion and now exhibited for the first time.

In the public mind one of our chief functions or duties is to unearth treasure, and a recent case will serve both as an example and a warning. A certain village in the Cotswolds has in the lady of the manor an historian who was convinced from the records that the church plate was hidden near the church in the sixteenth century to avoid the attention of Henry VIII.'s Commissioners, and the time had come to retrieve it. Naturally, the deposit would not be in the churchyard, as the digging of graves might bring it to light, and it was soon located in a farm building 100 feet from the church. The outer wall of what is now a cowshed was built in the eighteenth century, and parallel to it at a distance of about two feet a low wall was built in the last century to support the mangers, which were filled by passing along the narrow gangway in which the treasure had been located. An excavation revealed disturbed earth with chips of brick, and solid rock at about five feet, but no treasure, though the reactions for gold and silver continued. That was clearly a case of *rémanence*, and the deposit cannot have escaped notice when the footings were put in for one or other of the parallel walls. Gold and silver are notoriously difficult to find by dowsing, and treasure is always liable to disappear without trace, as until recent years the law of Treasure Trove has been considered unfavourable to the finder.

But it is with sterner stuff that archæology is mainly concerned, and it is a pleasure to mention the pioneer work done by our colleagues abroad, as the germ of this idea is to be found in Louis Merle's *Radiesthésie et Préhistoire* (1933) and Charles Diot's *Les sourciers et les monuments mégalithiques* (1935). In passing, a grateful reference to the use of the word *sourciers* for dowser, with its subtle allusion to *sorcier*; and we can briefly examine the French thesis. It is held that menhirs (solitary standing stones) and some round tumuli or barrows

are watermarks, indicating the presence of at least two streams converging underground. A third stream crossing the others near the junction at the same or a different level is taken as proved, and a good deal of meaning can be extracted from the stone. The smooth front is said to face the junction and to be vertical when the three stream lines intersect; but when the crossing is between the stone and this junction, the stone is tilted away from the water; if the crossing is further from the stone than the junction is, the stone is tilted towards the junction and the transverse stream. Similarly some dolmens and tumuli are located in the angle of converging streams, and water is found to flow underground between the stone rows of the Brittany avenues.

A point to be settled is whether the height of the menhir above ground corresponds to the depth of the underground water; but the connection between some prehistoric monuments and water is established, and the conclusion is that the Druids or their predecessors were expert dowsers, and selected their holy places by discovering blind springs, that is, the heads of underground watercourses. Every religion has a special use for water, and there may have been a practical purpose in marking these hidden supplies for use in time of drought or necessity, as it would be easy to dig a few feet from the smooth face of a menhir or at the centre of a stone circle.

There is a moor in South Devon that may serve as an illustration of the French theory. Farway Down, near Honiton, exceeds 800 feet above the sea, and is dotted with barrows or prehistoric burial mounds. At the cross-roads known as Putts Corner is an isolated grass patch on which is a recumbent menhir, once erect and moved a few feet to its present position within living memory. To the west is an underground junction of two streams which flow together to the north-west. One comes from the north-east to the cross-roads, and the other from the east, being joined, on the west of a barrow which has a pond on the other side, by a stream from the north and itself flowing parallel at a distance of 500 feet. Whether the barrow contains a burial or is a cenotaph is unknown, but both the mound and the prostrate menhir may have been watermarks, about 700 feet apart.

England is fortunate in its long barrows, a type that preceded the Bronze Age series and dates from neolithic times, which ended about 2,000 B.C. These are not so obviously watermarks as consecrated sites on account of underground water, and a good example at Notgrove, Glos., was recently excavated by Mrs. Clifford for H.M. Office of Works and described in *Archaeologia*, vol. 86. An unexpected feature in the middle of its long axis was a domed chamber with a burial on its floor and a blind spring exactly at the centre. The stream from it passes out of

the mound and eastward to join another: together they flow past the entrance to the burial chamber at the east end of the barrow. Wayland's Smithy, in Berkshire, is on the same principle, with variations. Its northern end is obscure, but across the approximate centre of the long axis is an underground stream, which then skirts the barrow and joins another stream, which originates below the centre of the cruciform chamber: together they flow past the main entrance, as at Notgrove.

The group of megalithic remains known as the Rollright stones, on the border of Oxfordshire and Warwickshire, is also famous in Folklore, and the theories concerning the monument are legion. The Whispering Knights, regarded as a dolmen with massive capstone, is found to have a concealed spring which runs underground to the north-west and may betoken a consecrated site; but 100 feet to the east there seems to be another blind spring with issue to the north-east, and in view of the cases just cited, it is tempting to regard these points as the centre and chamber of a long barrow, subsequently denuded by the plough.

The King's Men of Rollright consist to-day of a renovated circle, no doubt on its original circumference, but there seems to be a smaller circle round its central blind spring and two other irregular rings outside. These would constitute a quadruple ring round the sacred centre, and the outermost includes the mysterious King Stone on the other side of the road—the only survivor of eleven on that line. There are two independent stone circles in the neighbourhood, both with a blind spring at the centre, but not hitherto mapped.

A discovery outside an earthwork known as the Berth at Baschurch, Shropshire, was published in 1907 (*Proc. Soc. Antiq.* xxi., 324) and connected with the discredited Druids, who are, however, known to have been astronomers and would have had a use for the water-clock found beside the causeway leading to the double enclosure. The bronze dates from the Early Iron Age, but there is a blind spring at the centre of the earthworks and an earlier date is possible for their construction.

The next seven cases form a group of earthworks on the same general lines, though experts would see differences and probably not agree on a common date. An oval or circular rampart, sometimes double, and interrupted by two opposite entrances, can hardly be for defensive purposes, as there is a ditch parallel to, but at some distance within, the innermost rampart. As all of them have blind springs in the exact centre and were therefore probably holy places, they can be classed as temples (in the classical sense of sacred enclosures), the congregation being seated on the inner face of the rampart, and the authorities functioning in the central area isolated by the ditch. Diagrammatic plans are given in Allcroft's *Earthwork of England.*

The best known is Arbor Low, Derbyshire, which had a ring of standing stones round the inner area, but these are now all prostrate, and there are remains of tombs near the centre, no doubt of privileged personages. The Stripple Stones at Blisland, Cornwall, have an inner area nearly 200 feet across, enclosed by the ditch. The camp above Burrington Combe, Somerset, is of irregular shape, but its section conforms to type, as did the best of the Thornborough rings in the North Riding, though this has been mutilated. A site north-east of Salisbury called Figsbury has been excavated by Mrs. Cunnington and proved difficult to explain, but the inner ditch, separated by a berm from the rampart, no doubt served as a sunk fence enclosing the sanctuary. About 1770 Pennant made a sketch of a group of earthworks south of Penrith and published it in his *First Tour in Scotland*. The southernmost has disappeared, but the others remain in inferior condition. To the west is Mayburgh, an imposing circular rampart with a single entrance, and near the centre and blind spring, is one of eight standing stones, suggesting a central chamber with passage of approach. On the east, near the river, is King Arthur's Round Table, with the northern entrance imperfect, and a circular raised platform in the middle but not concentric with the area enclosed by the ditch. This would shew the celebrant to better advantage, and no trace of standing stones has been found to mar the view. Maumbury Rings, just outside Dorchester, Dorset, is clearly of this class, but instead of an inner ditch (can that have been subsequently filled in?) has a ramp at the foot of the earthwork as if to accommodate spectators.

All that can be seen to-day of the Castlerigg circle east of Keswick is a ring of standing stones, with a small enclosure inside, attached to the circumference, and two stray stones outside near the path leading from the west. Farmers and others who remove megaliths would normally disregard the packing stones at their base, and these, if left behind, would react like the stones they supported. Dowsing suggests that the monument originally consisted of five concentric rings, with a blind spring at the centre. There was a small one within the existing circle, and the enclosure already mentioned linked these two together. Another ring followed the existing stones closely enough, but the two outer rings were less regular, and respectively included the two outlying stones near the western path, one of which has been recently moved a few feet. The maximum diameter would be 500 feet, nearly five times that of the surviving stones.

This unsuspected diameter is, however, only one-fifth of the outer ring at Stanton Harcourt, Oxon. The three Devil's Quoits are well known, but few would imagine that they all lie on the circumference of the middle circle (or oval) of three, grouped

round a blind spring that sends a stream underground to the Windrush on the west. This was probably the most extensive monument in the country, measuring 807 yards against 369 yards at Avebury.

About one-third the area of Avebury is the well-known stone circle called Long Meg and her Daughters, at Little Salkeld, near Penrith. No one living has seen anything but an irregular ring of standing stones with an outlier of imposing dimensions about 70 feet to the south-west. As at Rollright, this seems to be the only survivor of an outer ring of 13 stones, but the line is interrupted on the west, no doubt owing to the proximity of another circle that has disappeared, less regular than the Daughters and about 20 feet less in maximum diameter. Both have a blind spring at the centre, and the issuing streams join to the north of the existing circle. This, however, does not solve the problem set in *Antiquity*, vol. viii., 1934, p. 328, on the strength of a drawing by Stukeley, dated 1725 and shewing a small circle on the higher ground south-west of Long Meg. The recorded diameter of this circle is 50 feet, and a circle, in the proper position (400 feet from Long Meg and of the specified diameter), is found by dowsing to have a blind spring at its centre, with the stream flowing south, and an outer circle of 300 feet maximum diameter, which, as occupying more space, would be cleared away before the smaller circle within, evidently before the time of Stukeley.

Stonehenge is a familiar sight, but there is much below ground that should be borne in mind. Excavations undertaken by Colonel Hawley for the Society of Antiquaries and H.M. Office of Works have revealed a ring of sockets in the chalk that once contained upright stones round the inner base of the ramparts: they are named after Aubrey, who mentioned some still standing in 1666. Two other rings of empty sockets between the existing monument and the Aubrey holes were quite unexpected, and are known as the Y and Z series, so Stonehenge was originally a much more elaborate structure than at present. Precisely at the centre, a few feet in front of the Altar stone, is a hidden spring, from which flow three streams: two of them unite near the north-east end of the great horseshoe, and the third flows approximately south. Here, as elsewhere, the underground watercourses avoid passing under any standing stone or socket, and it seems as if those responsible for the lay-out knew and respected these effluents from the sacred source.

An avenue or approach road has always been known to extend about 770 yards to the north-east, and Colt Hoare's rather fanciful plan (*South Wilts*, 1812, opp. p. 170) shews the northern fork pointing directly across the Cursus. An air photograph shewing the continuation of the southern branch to the Avon at West Amesbury was a notable achievement, and the line is

now inserted on the Ordnance map, but the northern limb remained a mystery, and there seems to be no mention of any standing stones lining the Sacred Way. Dowsing offers a solution, and not only extends the northern avenue to Durrington Walls, but locates the stones that lined both branches in opposite pairs, the intervals decreasing from about 500 feet to 300 feet as the monument is approached. Only one stone remains as a witness—the Cuckoo stone south-west of the Walls—and this finds its place in the scheme. The fork is about 3,000 feet in a straight line from the entrance to Stonehenge, and the northern terminus once had a ring of standing stones inside the earthen Walls with an underground spring and the stone-lined avenue starting from the centre. The distance to the centre of Stonehenge is just over two miles. All hitherto known about Durrington Walls is summarised in *Antiquity* for 1929, and excavation recommended as a last resource. From the terminus near the Avon to the centre of the monument by way of the southern avenue is rather more than 1½ miles, and the terminus was perhaps never complete, as dowsing reveals a blind spring in the centre of a broad oval, of which the southern half is represented by a single find.

Another feature of interest in the neighbourhood is the Cursus, generally regarded as a prehistoric race-course. It runs almost east and west about half-a-mile north of Stonehenge, and its width is 350 feet. It is traceable from the rounded end on the west for 3,000 yards to what is mapped as a long barrow right across it, but the mound has no blind spring as a long barrow should have, and is apparently a later obstruction, as the Cursus can be traced to a rounded end about 840 feet west of the Cuckoo stone, making a total of 3,730 yards.

Between the (restored) south bank of Durrington Walls and a long barrow near the Avon is a remarkable monument, also discovered from the air, and given the name of Woodhenge in contrast to its famous neighbour nearly two miles to the south-west. It has been carefully excavated and a monograph produced by Mrs. Cunnington, of Devizes. The plan shews six concentric ovals (nearly circles), and the sockets found in chalk subsoil for wooden posts are now marked by concrete stumps. In the centre a blind spring is revealed by dowsing, and from it flow two streams northward, threading their way between (not under) the closely grouped sockets. In the sacred enclosure, a few feet from the centre, was found the burial of a child.

There are several cases of earthen or stone circles arranged side by side but not quite in a straight line, and much ingenuity has been wasted in the attempt to explain their orientation. Dowsers will probably agree that the centres were fixed by the discovery of hidden springs, and therefore by geological conditions, not by astronomical calculations. The celebrated megalithic circles of Stanton Drew, Somerset, can be explained in this way.

An underground stream starts in the centre of the southern ring and joins another from the centre of the large middle circle, the course then being to the north. The small northern circle also has its hidden spring, the stream flowing into the neighbouring river Chew. Other good examples are the Hurlers in Cornwall and the set of four earthen rings of the same size at Priddy on the Mendips. Here a subterranean spring sends out a stream south-eastward from the southernmost of the four. The stream from the next on the north eventually joins that from the centre of the northernmost, and the fourth has its central spring, but the stream is absorbed by a pond close to the centre.

Few of the standing stones at Avebury now survive, but are sufficient to prove the former existence of a grand circle on the top of the ditch opposite the rampart; also two double circles almost in a north and south line and somewhat east of the centre —an unsymmetrical arrangement that requires some explanation. If the semicircle of Aldwych were completed by encroaching on the Thames in front of Somerset House, its area would correspond to that of Avebury within the ramparts, and the true centre is a little north-east of the cross-roads. By dowsing methods a very different picture is presented, and the original monument seems to have consisted of four multiple circles almost in a line, much like those noticed above at Priddy. The southern circle is always represented as double, but close round the central blind spring there is evidence of another small circle, and the underground stream passes eastwards under the rampart just south of the eastern (modern) entrance. Within living memory there was a standing stone at the centre—a most unusual position over a spring.

Near the centre of the next double circle, just north of the east-and-west road through the village, are still three stones, a large and smaller standing and the third discovered by Mr. St. George Gray, prostrate and in three pieces just below the turf. It is a curious thing that at the centre there is no underground spring, but on analogy one formerly existed and subsequently failed. The Cove is now found by dowsing to belong to an irregular square of stones, as though five rows of five stones had been spaced to form a covered area, the roof being probably of timber. A third circle within the northern rampart has been suspected, but never planned with conviction, and what is now submitted is a quadruple ring irregularly planned, with an underground spring at the true centre and stream flowing west, but surrounded by a figure with parallel sides and pointed ends. As the northern arc of this group encroaches on the ditch and rampart, it may be inferred that the stones, ditch and rampart of the great circle belong to a later period. Outside the rampart and astride the Swindon road is a fourth double circle with blind spring in the centre of the inner ring but the outer ring not

concentric. The stream flows directly to the east, and the maximum diameter is 350 feet.

Superimposed on these four sacred sites was the great circle, surrounded by a stupendous ditch and exterior rampart. As noticed above, the inner slope of the earthwork was intended for spectators who were kept off the sacred enclosure by a ditch proved to be about 25 feet deep. From the exact centre, two streams issue from a subterranean spring, and flow eastwards, perhaps at different depths. Both would supply a small pond in a farmyard as well as the large pond in the fosse, where they terminate. Two inner circles belong to this later period, but the only stone of which there is any memory was the Ring-stone, located by Stukeley near the southern entrance. There seem to have been twelve other stones in this ring, which has an average diameter of 900 feet. Still nearer the centre, but flattened on the eastern side, was a third ring of fifteen stones, passing through the centre of the southern ring and having an average diameter of 530 feet. Two stones were common to this and the northern ring just within the ramparts, respectively 100 feet north and 160 feet north-west of the Cove.

To the southern entrance of Avebury there was an avenue of approach from the south-east, formerly flanked by standing stones, of which several exist about midway between Avebury and the village of West Kennett. It is known as the Kennett avenue, and was considered by Stukeley to terminate in a stone circle called the Sanctuary on Overton Hill, about $1\frac{1}{2}$ miles from the Avebury entrance. He lamented the destruction of this circle in 1724, but the site has been excavated by the Cunningtons (*Wilts. Arch. Mag.* xlv., 300), and no less than five concentric rings of stone and timber posts established, with a few outside bearing witness to the avenue. The form is slightly oval and the maximum diameter 130 feet. Dowsing reveals a blind spring at the centre (indicating its original sanctity) and also the complete course of the avenue, which was not quite straight. The reconstruction of its northern end is described in *Antiquity*, 1936, 418.

Whether there was ever another approach to the western entrance has long been debated, but Stukeley had little doubt of its existence in the Beckhampton direction. He was, however, a student of serpent worship, and identifying the Sanctuary on Overton Hill as the head of a serpent, he endeavoured to locate its tail at the Long Stones, about a quarter-of-a-mile north of Beckhampton. This attempt showed that all trace of the avenue (except close to Avebury) had been lost in his day, but by dowsing it can now be traced with the sites of its flanking stones for a distance of $1\frac{3}{4}$ miles to another Sanctuary, with its oval enclosure and central spring, on the downs south-west of Beckhampton. The very twists of the Kennett line are re-

produced, and the great mound of Silbury is equidistant from the two avenues, evidently forming part of the great scheme. The Long Stones are found to be the remains of a double circle round a blind spring, like four other ruined circles on the same quarter-sheet of the 6in. map (Wilts. xxviii., S.W.). Such circles, like the barrows, might be expected near a religious centre, but the selection of this area for cult purposes was no doubt due to the presence of underground springs in the first instance.

Results obtained by rod and pendulum are apt to be personal, and dowsers may disagree as much as archæologists as to their accuracy and interpretation, but the constant presence of underground water at the exact centre of these earthworks and circles is a significant feature easily verifiable by others in the field. If this be allowed as intentional, the Druids or their predecessors, as the spiritual and intellectual leaders of their people, come at last into their own, and the selection of sites for consecration no longer appears arbitrary, but dictated largely by geological conditions, of which advantage was taken to advance religion and at the same time to provide an emergency water supply by means of a series of permanent and conspicuous monuments. Any new light on the ancient Britons should be welcome to students, not only in this country but abroad, wherever dowsing is becoming a subject of serious study in spite of "scientific" opposition.

AN EXPERIENCE AND A DIFFICULTY

By EVELYN M. PENROSE

In the December number (1938) of the *Journal* of the B.S.D. was an account of a most interesting talk given by Mr. W. W. Hawker of his experiences in Australia, and amongst other things he mentioned a man he knew there who could "stop underground water from running."

When the *Journal* reached me here in Johannesburg, I asked the leading water diviner of the Transvaal and two amateur diviners, a father and son (both successful water diviners), to accompany me and make the experiment for ourselves They were all very amused and sceptical, but they consented to do so. We went on to the property of the father, about ten miles out of Johannesburg.

Unfortunately, the property was all on solid granite, and we reckoned that the stream we selected must have been at least 500 feet down (but the problem of ascertaining the depth of water in South African granite is one I shall touch on further on).

I will now quote from Mr. Hawker's article in case anyone reading this does not remember the details. Mr. Hawker says : "The man who first brought divining to my notice had a peculiar gift. After I had found I had the power to divine moving water I met him on Yorke Peninsula, where we were divining for oil. He said : 'I will show you how I can stop underground water from running.' He found out a stream and asked me to mark it out, which I did. He then got a flat stone and put it in the middle of the stream. He then took the hammer with which I had driven the pegs in and knelt down, putting his left hand palm down on the ground. Then he began smartly striking the stone. After he had done this for about ten minutes, he asked me to map out the stream below him. I found I could not feel the water for quite 20 feet, but beyond this point I felt the water as before. He kept on tapping the stone and again feeling for the water. I found it had receded another 10 feet. I then tried the stream above him, and felt it right up to where he was tapping."

We all traced our selected stream, and marked it out very carefully on the ground, and tested the ground all round it to be sure there were no other streams near it.

The professional and I estimated the yield as 600 gallons per hour.

I placed a flat stone over the stream and started smartly striking the stone. After ten minutes the stream was tested, and all three diviners reported no change! This was disappointing, but I continued for one hour and ten minutes. Then the results were these. Under the stone no water could be felt at all. In front of me for about 1½ feet the water was barely

perceptible. Behind me for about 6 feet there was a trickle of water about 10 gallons per hour. But an extraordinary thing had happened. The stream was deflected into a semi-circle, the greatest width of the arc being about 9 feet from the original stream; and, more extraordinary still, the water had risen 70 feet in height.

In granite! Was the diverted water driven up into a higher crack, or was the actual water not diverted at all and only the emanations or waves (which I believe are said to be electro-magnetic) given off by the water, diverted?

There is little doubt in my own mind that the sharp concussion or vibration caused by hitting the stone, and, still more, the vibration from a drill, and, above all, a jumper drill, does affect the water, and I think it explains why in many cases a well which is abandoned as a dry hole will be found full of water after a short time, and will continue from that time on to be a satisfactory yielding well.

The same professional dislikes being called in on a consultation about a well if it is a drilled well, or to work in the proximity of a drill in divining a new well, as he says he has noticed for many years that "there is something queer about the water," and he says he can never be sure of his predictions.

Probably the depth of the stream accounted for the length of time it took to make any impression on it by hammering.

I am hoping that the accounts of this will lead other people to make this experiment too, or that if they have already done so I may read of their experiences through the *Journal*, and that they may be able to explain mine. I think the only way to actually *prove* whether it is a phenomenon of water or emanations would be to find a stream issuing from a bank or cliff and try the experiment on that. If the water was actually stopped by being driven back, or even considerably lessened, it would prove that it was the water. If the water was displaced, it should be traceable near by. I hope someone living in the country will be able to find a suitable spot and make the test.

I should now like to return to the question of the great difficulty of ascertaining the depth of water in granite in South Africa, or rather in the Transvaal, in hopes that this *Journal* will fall into the hands of someone who can throw some light on the subject.

I had done a lot of work on granite in Canada, and I must frankly admit that I thought I was quite good at the job! I never before had any trouble with the depth, but by way of precaution I always allowed 10 feet on every 100 feet over and above the depth I got. I was asked to go on a very large tract of land where the need of water was very great, and although it was a solid granite area (pink and grey granite) I did not hesitate to do so.

I found several locations, and two in particular, which I reckoned would yield 800 gallons per hour and 1,000 gallons per hour respectively. I reckoned the depth of the 800-gallon location (which was the best location for the Committee's needs) at about 300 feet and said 350 feet for safety.

As a rule, I worry a lot over any water predictions I do, far more than over mineral predictions (which is obviously absurd, as the latter involves far more money than the former to develop). However, I was so confident about this prediction that I never gave it a second thought. Imagine my dismay when I got a long-distance call from the secretary to say they had gone 350 feet and got a dry hole!

I immediately got into touch with all the amateur diviners I know out here, and they were unanimous in saying that they could none of them tell the depth in granite and they believed it to be impossible.

I then took this leading diviner of the Transvaal down to this property (which was some 300 miles away) at my own expense. As he was at the time very prejudiced against me (although he hadn't met me!), I knew his verdict would not be biassed in my favour! He admitted to having had great trouble with granite himself in the old days and had specialised in it in consequence, and now had a great number of successes to his credit.

He confirmed my two findings to an inch (both were originally found on an aerial photo as no scale map was obtainable), and without any previous knowledge gave the same figures for the yield. He also gave the depth of the first stream as "around 350ft.," *but* he said that in dealing with granite he always *doubled the depth.* We spent two days working on this big area, and found one location which we estimated would give between two and three thousand gallons per hour. We doubled the original depth, and the Company pulled up the drill from the first hole and started on this, but, alas! at double our depth they have not struck the water and have a dry hole.

I don't know which is the most sick about it, the Company (which is indirectly the Government) or the diviners!

We (the diviners) are absolutely confident still that the water *is* there, and in very large quantities, and the Company is, of course, equally confident that it is *not* there!

I always feel that one diviner might make a mistake (one of the most amazing things about divining to my mind is that one may use the same method and take the same care as one always does, when one is successful, and then for no apparent rhyme or reason one has a failure), but for two diviners working at different times and with two entirely different methods to be mistaken seems to me impossible.

Is there anything in granite that could be affected by the great heat of the South African sun? If any geologist, scientist or experienced diviner can offer any suggestion that may lead to a solution of this very baffling problem we should be most grateful.

This experience makes me feel more than ever how very unwise it is of any of us to say (and still more to put in writing) that we have "found" this or that—water, oil, diamonds, hidden treasure, &c.—until it is actually *proved*. I know from experience how very much it prejudices outsiders, Governments, mine managers, property owners and sceptical individuals against divining. One makes these announcements in all good faith, but the only way to prove anything is to bore or dig for it.

As I have always been one of the chief offenders in this, I write this criticism for myself in future as much as for my co-workers!

MY EXPERIENCES AS A WATER DIVINER

[Notes of a Lecture by Mr. Noel Spong to the British Society of Dowsers on March 16th, 1939]

The following are some of the points in Mr. Spong's lecture and in his answers to questions afterwards.

He uses a hazel twig, preferably fresh cut. He does not find a whalebone rod satisfactory. The rod turns up for water and down for minerals such as iron and Sussex marble.

To counteract the effect of iron, which is very common in the Weald, he always carries an iron nut in the hand.

He finds the pendulum useless for locating water, and for other purposes only a black pendulum or a pendulum of white ivory is effective.

He estimates depth by doubling the distance between the edges of the stream, found by approaching it from opposite directions, but this method only works for comparatively shallow depths, *i.e.*, up to about 60 feet. He prefers to work in the morning, when his estimates of depth are more accurate.

He does not attempt to estimate quantity in gallons per minute, but can tell the comparative extent of yield roughly by the physical sensation experienced.

Most of his divining he has done is in the Weald, where the depth is fairly constant according to the geological formation of the locality. North of Horsham he makes an extra allowance of 30 feet in the depth.

In general he gets one per cent. of failures. He considers it a failure if he is more than 10 feet out in estimating depth.

He learnt divining from the well-known diviner, Mr. Roberts.

On his first job he was asked to locate water in a 10-acre field near Horsham. He could find nothing, and was then told there was a well, 100 feet deep, near some farm buildings—but it was quite dry. Two other diviners had professed to find water at 50 feet, but they were both wrong.

After an earthquake in Sussex about a year ago he was asked to come to Warnham Court, as a cottage well had suddenly run dry. He found a stream about eight yards away; the estimated depth was 36 feet, but water was found at 40 feet. The water, unlike that of the old well, was very hard, showing that it was from a different source. The stream which had supplied the old well must have disappeared down a fissure caused by the earthquake.

The Brighton Water Works had occasion to extend their supply by headings in the chalk downs east of Lewes. He and Mr. Robinson located a spot where water was abundant. The Water Works Engineer, however, who does not believe in divining, made three abortive headings in other places, but eventually made a successful heading at the spot located by divining.

A problem has arisen from the extension of piped supplies by local governments. They draw their water from sources which have for centuries supplied the wells belonging to the farmsteads under the Downs, so that these wells are drying up.

On one occasion he was asked to find an old well somewhere in a 50-acre field near Warnham Court. He found it. The history of the well was that it had belonged to an old house which had been situated in the middle of the field. Several generations ago the owner had accidentally caused the death of a boy, and the house was haunted, so that no one would live there. It was eventually pulled down, leaving no trace.

He finds that over a person lying down he gets a downward reaction at the feet, upward at the heart, and downward at the head. On one occasion he was demonstrating at a girls' school and got a very feeble reaction over one girl's heart. On inquiry he was told that the girl had a weak heart.

Over wireless he gets a swing of the pendulum over the long wave, but the pendulum stops over a short wave.

UNDERGROUND WATER SUPPLIES

[EXTRACTS FROM A PAPER READ BY J. P. LE GRAND, M.INST.C.E., M.I.MECH.E., F.G.S., AT A MEETING OF THE INSTITUTION OF SANITARY ENGINEERS, HELD AT WESTMINSTER ON FRIDAY, MARCH 3RD, AND REPRINTED FROM *The Surveyor* OF MARCH 10TH]

The problem of obtaining water from underground sources is always one of interest, and resolves itself into a battle between the forces of nature and the wit of man. The casual observer is often under the impression that it is only necessary to sink or bore deep enough, and water will be invariably found. This, however, is certainly not the case in actual practice. It is quite possible to bore hundreds of feet, and yet not find water in any appreciable quantity, or the water, if found, will turn out to be quite useless either for commercial or domestic purposes. In many cases, deep boreholes have produced brackish water or water so highly impregnated with traces of undesirable mineral salts in solution as to be practically useless.

At the present time, quite a number of different systems of well drilling are in vogue. They can, however, conveniently be divided up into two main branches, viz., the percussion and the rotary system. These two systems can again be sub-divided. Thus, under the percussion system we have the cable, the hollow rod, the Californian, the Canadian or Galician where wooden rods and iron rods are used respectively. The rotary system can be sub-divided into the hydraulic rotary or mud flush, the core system, the diamond or calyx and the auger system.

THE TRUE ARTESIAN WELL.

When a water-bearing stratum has been reached, the water very frequently rises a considerable height in the borehole, and sometimes overflows, thus forming a true artesian well. An interesting example of this type of well was recently drilled in the Slough district to a depth of 1,033ft., at which depth a supply of water was found in the lower greensand formation. The hydraulic pressure was sufficient to raise the water and cause it to flow into a tank 40ft. above the surface.

It is quite possible to bore holes as large as 6ft. to 9ft. in diameter, but the mere fact that a large hole has been drilled does not necessarily mean that an adequate supply of water has been found. Under these circumstances, the next operation usually is to drive headings or adits at various depths below the surface and in various directions until an adequate supply of water has been found.

Headings are usually made about 6ft. high and 4ft. 6in. wide, thus allowing the operator or heading driver sufficient room to work comfortably.

In heading driving, it is necessary to have pumping machinery, in order to dewater the headings and prevent flooding. Headings form a natural underground storage.

Shafts are usually sunk by hand, either using hand tools or pneumatic drills until water is met with. They are usually lined either with cast-iron cylinders or brickwork, or alternatively with reinforced concrete, or a combination of these. In addition, steel cylinders are sometimes employed, these being connected together by means of electric or acetylene welding.

Another type of lining which has quite recently been developed is by means of pre-cast reinforced concrete cylinders, these being lighter and cheaper than cast-iron.

In theory, there is no limit to the length an adit can be driven. Recently one such adit was driven for a distance of over a mile from the shaft.

If the rock met with is unusually hard, then blasting is resorted to, in order to make adequate progress. In the chalk and similar formations, however, it is generally not necessary to employ blasting, and good progress up to as much as 15 lineal feet per shift can sometimes be accomplished by means of pneumatic drills.

Yield.

It is sometimes asked: What is the relation of a yield of a boring to the diameter? This question is difficult to answer, and much depends upon the formation being drilled. In freely-bearing sandstone such as the Bunter sandstone, it can be said that the yield varies roughly as the diameter of the bore, but in fissured formations such as chalk or carboniferous limestone, there is no definite rule, and it is quite possible for a 6in. bore to yield as much as, if not more than, a 16in. bore—everything depending upon the number of fissures struck.

When testing a well or borehole on completion, it is usual, in the case of a private supply, to test continuously for twenty-four hours, making a careful note of the rest water level at the start, and an equally careful note of the drop in water level, hourly while testing.

In the case of public supplies, the authorities usually require either a seven or fourteen days' continuous pumping test, the water levels being noted as mentioned above.

Tests, however, even of this duration, are not always conclusive, but the fact remains that the yield often varies with the season of the year. It is always wise, therefore, when testing, to pump at a quantity somewhat beyond the required normal yield.

The relation between the static water level and the pumping water level is an important factor which must not be lost sight of when testing a well. The better the yield, the less the water

will be depressed. In sandstone and similar formation, the amount of depression or fall in water level whilst pumping varies approximately as the square of the yield. In the case of fissured formations such as chalk or carboniferous limestone, the rule does not necessarily apply, and the fall may vary in direct proportion to the yield.

Elusive Water.

Before water can be taken from underground sources in any large quantity, it is always desirable to study the geological conditions of the site, for although it would seem that the various geological strata are either water-bearing or non water-bearing, there are no actual hard and fast dividing lines. Thus sandstone may be coarse or fine, the one highly water-bearing, the other not. Limestones may contain underground rivers of water, or be quite dry, or quite impervious. Again, some chalk formations may contain large quantities of water in fissures, other chalk formations may be quite impervious.

The flow of underground water may be highly elusive, and sometimes resolves itself into a veritable game of "hide and seek." To mention a typical instance, a shaft was sunk in Somerset and adits were driven in various directions in the carboniferous limestone formation, the rock being sufficiently hard to necessitate blasting operations. After working for nearly eighteen months, the scheme was on the point of being abandoned, but as a last resource a water diviner was called in. He indicated that water would be found at a certain spot a short distance from where the shaft was sunk. Accordingly, a further adit was driven to the spot indicated by the water diviner, but the adit failed to find any supply. At this juncture the diviner again investigated the site, and came to the conclusion that, although the adit had been driven in the right direction, the level of the adit relative to the supply was too low. Exploratory holes were therefore carried out by means of hammer drills drilling 2in. holes in various directions from the adit. One of these holes suddenly struck the water, and a yield of over 3,000 gallons an hour was obtained, which was increased to 5,000 gallons an hour.*

This example is mentioned to show how elusive underground water can be in certain cases.

Another typical instance occurred quite recently at a large electric power station in North London. A borehole 18in. in diameter and 600ft. deep was drilled, but the yield only proved to be 400 gallons an hour. As a supply of water was of vital importance, another bore was drilled 100 yards away, 12in. in diameter, and 500ft. deep, and in this case, a yield of over 7,000

* See *B.S.D.J.*, II, 12, page 193.

gallons an hour was obtained. It is quite possible for two bores only 10ft. apart to give totally different results as regards the yields.

Advantage of Deep Boreholes.

Generally speaking, deep-seated water supplies are free from pollution, and it is here that the deep borehole scores over the shallow-dug well. The latter are not only liable to pollution, but may be seriously affected in times of drought. Deep-seated supplies, on the other hand, are not nearly so likely to be affected in times of drought, and the chances of pollution are greatly reduced, provided the well is suitably lined with tubing.

In the case of a deep well, it is quite possible to pass through several zones of polluted or unsuitable water. These zones, however, can be sealed off by means of lining tubes. A case of this description occurred at Farnham a few years ago, where four zones of water were met with. The water, however, in the first three cases, was found to be highly impregnated with iron. These zones were effectively sealed off, each tier of tubing being cemented into position. Finally, a zone of iron-free water was met with at a depth of about 400ft.

If a borehole fails to yield the required quantity of water, steps are sometimes taken in order to increase the yield. One method consists of using air lift pumping plant and resorting to back-blowing. Back-blowing consists in forcing the compressed air down the borehole whilst the top of the borehole is sealed up. This has the effect of forcing the water rapidly downwards into the strata. A valve is then opened at the top of the bore, thus releasing the air pressure and causing the water to surge back nto the borehole. This continual surging of water will frequently increase the yield of a well to a surprising degree.

Sometimes shot firing is resorted to, in order to shatter the rock and increase the yield, charges of dynamite being placed at selected spots.

Another method sometimes employed consists in boring subsidiary or side-tracked holes from the side of the main borehole. This is done by lowering down a special tool known as a "whipstock," and it is quite feasible to drill any number of side-tracked holes in any direction. If necessary, a charge of explosive can be lowered down any one of the deflected holes.

The temperature of deep-seated water is usually uniform all the year round, at a figure of about 54 degrees F., but it varies with the depth below surface. Roughly speaking, an increase of about one degree can be allowed for each 64ft. in depth.

Successful water supplies can sometimes be obtained by means of driven tube wells, or what are known as Abyssinian tube wells. This simple system consists of driving small diameter tubes into the ground, the bottom tube being fitted with a steel point and

having perforations, through which the water can flow. These tube wells are ideal when a bed of impervious clay overlies water-bearing formations, such as sands and gravels. The tubes, being driven into the ground, compress the soil and form an effective seal and thus avoid surface contamination. Having driven the tube, it can be coupled up direct to any type of pumping plant, the tube well itself acting as a suction. Several tube wells can be driven in the vicinity of each other, and coupled up by means of a common suction pipe ; thus quite large quantities of water can be obtained.

Pumping Plant.

Artesian wells seldom overflow in actual practice, and it therefore becomes necessary to raise the water by some form of deep-well pumping machinery. There are several types of deep-well pumps now on the market, the oldest and best known being the reciprocating plunger pump.

The pump itself is placed at the required depth below the surface of the water, and connected to the surface by a rising main. The bucket or plunger is connected to the surface by means of wooden or steel rods, working inside the rising main.

A more recent type of deep-well pump is the vertical spindle turbine pump. It consists of a centrifugal pump placed vertically in the borehole, and connected to the surface by a steel shaft or spindle, which in turn is connected to a motor fixed at the well head. The vertical spindle is guided by suitable bearings made of *lignum vitae*, lubrication being supplied by the water itself.

Another type of pump which is sometimes employed is known as the ejector pump. The interesting point about this pump is that, although it is a deep-well pump, the pump itself is placed at the surface. In the borehole, however, are placed two concentric tubes connected at the bottom by means of an injector. Water passes through the ejector at high velocity, the flow being obtained by by-passing a certain percentage of water from the delivery main of the pump. It is quite possible to raise water from a depth of 300ft. or more by a pump of this description. Efficiencies, however, are generally low, and seldom exceed 33 per cent. Even so, in many cases, it compares favourably with the air-lift type of deep-well pump where water is raised by means of compressed air which is carried down by means of an air main, and passes through an injector which is connected to the bottom of the rising main. Here, the air mixes with the water and forms an emulsion which, having a specific gravity less than that of the water, tends to rise to the surface, and thus form an overflow.

Another type of pump which is now largely coming to the fore is the underwater pump. This consists of a motor direct

coupled to a centrifugal pump. The complete unit is enclosed in a metal case, which is lowered down the well by means of the rising main. A submarine cable conveys electric current from the surface to the motor. High efficiencies can be obtained from pumps of this description, and they are now being made up to 200 h.p.

Costs.

As regards the cost of pumping by means of deep-well pumping machinery, this varies considerably according to circumstances. With electricity at 1d. a unit, it roughly costs about 2d. a thousand to raise water from a depth of 300ft.

The cost of boring naturally varies considerably with the size of the bore, the nature of the strata, and the amount of tubing required, but, roughly speaking, a 12in. bore 500ft. deep in the London area would cost approximately £800, while suitable pumping plant to raise, say, 5,000 gallons an hour from 300ft., would come out at about £700.

It may be asked whether water diviners are of service when the question of a borehole arises. This cannot be answerable by a direct "Yes" or "No." It is generally advisable to keep an open mind. In certain formations such as hard limestone or hard chalk which are fissured, the water usually travels through the fissures, and in these cases the services of a diviner might prove an asset. On the other hand, in sand beds or soft sandstone, water can generally be obtained equally well in any one spot as in another. The whole matter should be considered in connection with the geology of the district, coupled with common sense.

DISCUSSION AT INSTITUTION OF SANITARY ENGINEERS' MEETING.

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Opening the proceedings at last Friday's meeting of the Institution of Sanitary Engineers in Westminster, at which the foregoing paper was presented, the President, Mr. David M. Watson, B.Sc., M.Inst.C.E., who was in the chair, said it was difficult to exaggerate the importance to-day of being able to find not only water but oil by sinking wells and bores, and Mr. Le Grand, the author of the paper to be read that evening, was particularly able to deal with that subject. Mr. Le Grand had spent his life, to use his own words, playing hide and seek with Nature, and he had robbed Nature of water as he had robbed her of oil, not only in this country but in various parts of the world, in Trinidad, in the Dardanelles and in Salonika, and possibly in other places. He had put down bores 4in. in diameter

and he had put down bores 8ft. and 9ft. in diameter. He had sunk shafts and driven adits, and he represented a firm with a 60-years-old name and a wonderful reputation.

Defence against Contamination.

Lieut.-Colonel F. C. Temple (Westminster), past-president, who opened the discussion, said the paper referred to pollution travelling considerable distances, and it was on record that pollution had been traced, through fissured ground, something like five times as far as the author had mentioned. It was recommended in the paper that when work was going on in an open well, there should be two lines of defence against contamination, in the form of sterilisation and filtration. Personally, he preferred two different forms of sterilisation. It was quite possible for disease germs to go through filters and typhoid germs had frequently been known to go through filters. As to sterilising agents, chlorine was at the same time the most economical and the easiest to use, but it did not give a very long period of immunity, unless there was enough chlorine present to make the water taste. Ozone was very good, but it meant cumbersome apparatus and probably considerable expense.

A fourteen-days test was mentioned by the author before a well was put into use, but that did not seem to him to be nearly enough. In one case of a 24in.-diameter borehole, a test was made continuously for ninety days, and a very careful graph was made by means of pilot holes of the depression round the well, from which a calculation was made of the quantity of water likely to be obtained permanently. It was decided to take 70 per cent. of the average yield of those ninety days, as the probable yield of the well, but in four years it had dropped to 50 per cent. That was not due to choking of the casing but to a definite lowering of the water level.

Mr. C. B. Jackson (Westminster) said the only question he wished to ask was with regard to the ventilation of the adits which had been illustrated on the slides. In the case of a coal mine, before men were allowed to go down quite shallow depths it was necessary to put in a system of ventilation, but looking at the headings shown on the slides there did not appear to be any method of providing fresh air. He did not know whether the water coming through the well was sufficient to induce fresh air into the heading to keep the men alive, and perhaps the author would have something to say on that point. When working 700 or 1,000 feet deep in a 6ft. well from which was run an adit, how were these men supplied with fresh air?

Mr. Percy Griffith (Westminster) thanked the institution for inviting him to the meeting and allowing him to take part in the discussion, on a paper by a gentleman who was often referred to as a contractor. He knew of an institution—and probably

more than one—where the practice of inviting contractors to give papers was taboo. They were said to be bound to advertise their businesses, but meanwhile consulting engineers did that with impunity. The reading of papers was their only method of advertising themselves, and they did it without any criticism. (Laughter). In his experience, however, he had found that the practical men who were carrying out these works which consulting engineers designed and supervised, must of necessity know more about it than the consulting engineers, and when these contractors came forward in an institution like this and gave the benefit of their experience, in his view there was nothing more to be said than "many thanks." (Hear, hear).

Boring at Gainsborough.

Continuing, Mr. Griffith said he would like to add one instance of an historical character in relation to boring for water. In the year 1896 he was left alone by his partner, who had died, with the responsibility of carrying out a big boring at Gainsborough, 1,500ft. deep and 2ft. at the top to carry the pump. The point of interest about it was that this was a second proposal. The original proposal which his partner had made, and which he had assisted him in, was to sink a well 10ft. or 12ft. in diameter and 250ft. deep, in which to put the pump, and then to carry down a borehole to the sandstone, which was available at 700ft., the borehole having to be 800ft. in the sandstone, the idea being for the water to be pumped from the 10ft. or 12ft. portion of the well. In those days there were no borehole pumps; there were only ordinary pumps and mostly three-throw pumps, which had enormous advantages until it was found that very much better results could be obtained with borehole pumps. Therefore, he found himself at an early stage in his career, and all alone, faced with the task of completing this change from a well to a borehole, and he was bound to say that he felt a great exhilaration as a young man in having this task to carry out. At the same time, he congratulated the younger men to-day upon having been born at a time when they were not troubled with the old-fashioned pumps and methods. They were fortunate in having at their disposal the modern methods and devices which in his early days were not known. Therefore, on the present occasion he found himself in a very happy position, in that he was surrounded by other water engineers who had escaped the difficulties he himself had had to face.

After the Gainsborough boring, he had another job, which was to carry out a similar borehole under somewhat similar conditions at Lincoln, where a much larger quantity of water was required, and it was suggested that it could be obtained not only from the new red sandstone but also from the Bunter pebble beds. Geologically the evidence was very favourable,

and, qua water, they were entirely successful, because there was a very large supply. When the water was tapped at 2,200ft., it overflowed and ran down into the river Witham, and they were thinking of a magnificent scheme for utilising this water when the local surveyor called for a sample for analysis. From that analysis it was difficult to understand how the water ran like water at all. It almost seemed one could walk on it, so full was it of solids. Moreover, the hardness was in the region of 200, and what that meant he hardly knew. At all events, it was impossible to use the water, and the whole scheme was a failure. After having enjoyed such a successful opening to his career as he did with the Gainsborough scheme, it was a great disappointment to suffer defeat in this way, and he only hoped that nobody at that meeting would have to go through such an experience.

Geological Information : Water Divining.

The author had been a friend of his for a long time, continued Mr. Griffith, although it was he himself who was the old man and not the author. They had had many happy discussions together on various matters, in addition to water supply. So far as the present paper was concerned, the author had given but a small proportion of his geological knowledge, and he was not to be blamed for that, because if he had gone into that in any detail it would have taken a very long time. However, it seemed to him that the author had rather carefully evaded giving too much information about geology, but personally he had always found the geology of this subject the most interesting feature of it.

Then there was another factor which the author had rather carefully evaded, or at all events he had referred to it only cursorily, and that was the work of the water diviner. The fact was that the author himself was a water diviner, and could tell them all about it. The pity was that the author had never banked on the methods of the water diviner as a solution of the troubles of the water engineer. It seemed to him that those who had pushed water divining had offered too much for the money, and it had afterwards cost a great deal more money for very little advantage. At the same time, it was a most interesting experience to walk behind the author and see him with two rods in his hands saying exactly what was happening underground, and where water was to be found. That sounded almost Utopian, but he was happy to be able to tell the author and the meeting that at the place where this happened a trial boring was quite successful, and since then the water from that particular spot had more than confirmed all that the author had told him from the use of his rods. Whilst he did not suggest that the water diviner could be completely relied upon, there

were many occasions when, however complete the geological evidence might be, the water diviner could tell the difference, so to speak, between one end of the room and the other. As the author had pointed out, it often happened that water was found in one place and not in another place not very far away, and the water diviner would very often put them right on that point.

He was not quite so doubtful as the author about the possibility of utilising geological evidence as a guide to the finding of water. He felt that geology, plus the diviner, did a little more than could be obtained in any other way. If they could not get some geological evidence, he suggested the attempt should be given up, but if there was some geological evidence he believed it could be assumed they were very near water and that there would not be a waste of money.

Commenting on the author's reference to zones of water supply in different layers of sand, Mr. Griffith said he believed he was right in saying that such conditions were peculiar to the lower greensand, and that they were very rare anywhere else at all, if they existed anywhere else at all.

Another difficulty which the author had perhaps very wisely avoided mentioning was that of running sand with water. When there was as much sand as water, it was necessary to sit down and think and it might even be necessary to go home and think. Running sand was one of the worst things in water supply, and it would be interesting to hear from the author on that point.

Rate of Pumping.

Mr. C. H. Trusler (Air Ministry) asked the author to say something about the rate of pumping in these wells. Were there any limits to the rate of pumping, because in some cases the rates of pumping had a direct bearing on the effect on some of the tubes at the bottom. Therefore he thought there must be limits. Also in the case of firing shots, how was the effect localised in order not to damage the casing of the well in any way? Out East, the rate of pumping was a definite quantity because the water-bearing strata was near sand, and if the water was induced too quickly, the sand caved in and choked the tube. A picture had been shown of an Abyssinian tube well, and he had seen 2in. bores sunk, although they were not recommended. They were very effective, however, but were inclined to choke, and there was some difficulty in clearing them. Was there any method of blowing through the tubes to clear them again in such circumstances in the smaller sizes of tube?

Mr. F. W. Pearce (Westminster) asked what the author meant when he referred to "surging." It was stated in the paper that pipes were driven or surged into the borehole.

Mr. Le Grand, replying to the discussion, said he did not wish to cross swords with such an expert as Colonel Temple on the question of the distance at which contamination could take place. It was possible contamination might extend beyond the two miles he had mentioned, but that distance was the farthest he had heard of. At the same time he could quite appreciate the possibility of it extending as far as five miles. With regard to lines of defence when pumping water, when a contractor was working in an adit, it had been found that in chalk the best means of getting over the difficulty was to chlorinate, and then to filter through gravel screens which were supplied in his case by a well-known firm. That gave complete immunity, and it was specially important in the case in question because the water was not pumped into a reservoir, but went straight into the houses of the people. However, there had been no trouble whatever, although the men were working in the adit while the water was being pumped. He agreed that a fourteen-days' pumping test might not be enough. It all depended on the season of the year. In a very dry year the supply might be very considerably reduced, and it might be necessary to pump for six months if one wanted to be really on the safe side. Personally, he thought a fourteen-days' pumping test was a waste of money. Generally speaking, after a short period of pumping, the water reached a steady level, and if that level remained constant for two or three days, that seemed to him all that was necessary. If, however, the water in the early stages of pumping continued to drop, then it was necessary to continue pumping. If, however, the water reached a constant level, then it was no use continuing pumping for fourteen or twenty-one days.

With regard to ventilation, mentioned by Mr. Jackson, that was simply done. Generally speaking, the work was done in the adits with pneumatic drills, and there was sufficient compressed air coming off to keep the shaft ventilated. If, however, there was not, then it would be necessary to put a fan down and pump fresh air in.

He had been very interested in what Mr. Percy Griffith had said. There had not been time for him to touch on everything in the paper, as the subject was such a large one; therefore, he had left out geology. It was quite right that there were zones of water, and they were almost entirely restricted to the lower greensand. The case he had mentioned in the paper referred to the lower greensand.

As to water divining, he did not profess to be a water diviner; indeed, that was the last thing in the world he would say he was. He amused himself playing about with rods, and in this connection it might be interesting to mention what happened

in the case of a large power station. The chief engineer was watching him as he went over the ground, and he came to a point where he said there was something there. The engineer said that was quite right, there was an electric cable there! He then went a little further, and said there was something at that spot, and the engineer again said that was so, there was a sewer there! He then went to a third spot, and said there was something there, and the engineer replied there was a 4ft. cast-iron main! Therefore, added the author, he had to be very careful what he said about water divining. At the same time water divining, coupled with common sense and geology, was of some use.

As to the rate of pumping, mentioned by Mr. Trusler, it was impossible to say what a borehole would yield until pumping was started. In one case they had hoped to get 60,000 gallons a day, and a 36in. borehole was sunk with that object in view, but the yield was only 2,000 gallons.

Mr. Trusler asked if any in-caving took place if the rate of pumping was too high.

Mr. Le Grand said that might happen occasionally, but, generally speaking, in a soft strata it was the practice to line the borehole with a perforated casing to prevent the sides from caving in.

As to shot-firing, also mentioned by Mr. Trusler, care must be taken not to fire where the tubes were, otherwise the borehole would be ruined. It was necessary to pull the pipes out before shot-firing took place. He had known of cases in which the shot was fired in the tube too high, and it ruined the tube and the borehole.

Small Abyssinian tube wells were cleared by what was known as tilting. It was rather difficult to explain without a diagram, but it had the effect of disturbing the water and causing it to gush in and out rapidly, and that washed the sand away from the side. Finally, what happened was that the sand was washed through, and the coarse sand packed itself round the tube and formed an additional natural filter. By continually tilting that result could be achieved. He remembered a well which almost ceased to function, but by tilting for twenty-four hours they had got 300 gallons an hour out of it.

With regard to the last question concerning the meaning of surging, this simply meant lifting the tube up and down slowly and letting it sink by its own weight. If tubes were driven they might be damaged in some cases. It was better to surge than to drive.

Mr. Arthur J. Martin (Westminster) in a communication in which he expressed regret that another engagement which he could not put off prevented him from attending the meeting, said the author had given a most informative and interesting

paper on a subject of great importance. It contained a mass of useful information with regard to the occurrence of underground water, and the methods of drilling now in use.

The author did well to point out that boring for water was not always such a simple matter as it was often supposed to be, and that the yield from boreholes sunk under conditions which were apparently similar in all respects might vary in an unaccountable manner. He himself recently sank two 14in. boreholes in the chalk, each to a depth of 500ft. Although they were only 12ft. apart, the water came much more freely into one of them than into the other. The rate of pumping in both cases was 10,950 gallons per hour, but whereas one borehole yielded this quantity from a depth of 45ft. below the rest level, the drop in the other was no less than 71ft. These results were obtained during the test pumping. It was doubtless possible that long-continued pumping might equalise the levels in the two boreholes.

It would have been interesting, concluded Mr. Martin, if the author could have given some fuller information as to the lowering of the level of the underground water in the London basin during the past 100 years. It would be useful, too, if he would append to his paper a table showing the efficiencies of the different methods of lifting water from boreholes.

The President said it was unnecessary for him to add anything to the discussion, and if he had one criticism to make, it was that the author had been altogether too modest. It would have been very interesting if the author had said something of his triumphs and successes, but perhaps on another occasion he would be able to interest the members still further. He had in mind, for instance, a case in which he himself had set the author what seemed to him a very difficult problem. The author had been asked to start a bore at road level at a specific point in the roadway, and to hit a specific point in a sewer some 50ft. below, but not vertically below. The sewer was already constructed of cast-iron segments, and the author was asked to put down a 12in. cast-iron tube and to hit a particular segment of that sewer. That was done at an angle of about 15 degrees, from the vertical sometimes, and a tolerance of 8in. was allowed on the circumference of the sewer, but only 3in. on the length, otherwise the segment would have been missed. That was found to be perfectly practicable, and there must be many things like that which the author could tell, and which would be exceedingly interesting.

The vote of thanks to the author was carried, and the meeting then closed.

THE ANTENNA ROD

By H. O. BUSBY

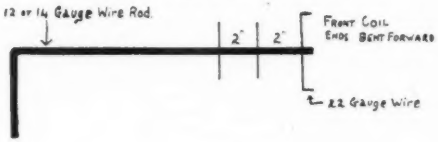
Anyone who has had experience with hunting dogs of any kind, bloodhounds and others trained to the following of scent trails, knows that a well-trained and experienced dog can follow a trail through a maze of conflicting scents. In the same way an experienced dowser can follow a line of radiation coming from one particular source, be it a stream of water or anything else, no matter what other lines he may cross in doing so. To quote Dr. Brunler: "Our five senses transmit to our brain the rhythm of vibrations of varying wave lengths; but we have another if not several other senses which are still unknown to us" (*B.S.D.J.*, Vol. II., No. 12). The human being has this advantage over the animal, that he has a more highly developed brain and can develop any of these hidden senses when the realization comes to him that he actually does possess more senses than the five, and has a personal demonstration that he can use one or more of these senses. Just as a puppy with a naturally good nose will fly all over the place when he meets a mass of scents, and be bewildered by them, so the budding dowser, for instance, will soon feel himself lost and bewildered by the actions of his rod.

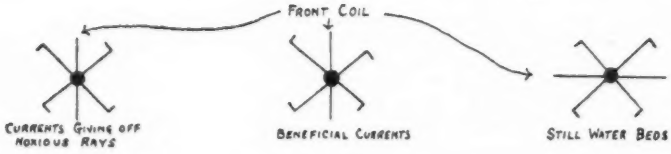
It is reasonable to suppose that a being with a highly complex brain has centres within it which can respond to more varied stimuli than the lower forms of life, animals, insects, &c. It is usual to refer to instinct, as a convenient term, when trying to explain the reactions of these various forms of life to different stimuli. It may, perhaps, be more nearly correct to say that the law of resonance is acting on the cellular oscillations through the medium of the ether. Dr. Lakhovsky, of Paris, says that all such mysteries of nature can be explained by the three, resonance, *l'universion* (universal vibration interpenetrating everything), and cellular oscillation. The human being has no antennae, for instance, but if he has an external aid in the form of a sensitive rod he supplies himself with the missing antenna; with this as an aid to his complex receptive brain he can do more than he ever thought possible. The French journals provide much evidence of the use of pendulums as adjuncts in diagnosis.

I have made a form of angle rod which even looks like an antenna of an insect, and is variable so that it gives sensitivity and selectivity somewhat comparable to that organ. To the ordinary angle rod I have added three small double-pointed coils. These coils are partly insulated from the rod by means of the material known as "spagetti." They are made by bending a small gauge (22) iron wire in the middle then winding the doubled wire round the rod, four or five turns about two turns

in direct contact with the wire, the other turns being insulated by a short piece of the material, the points project on opposite sides of the rod. The coil points are about 2½ inches in length, that is, they extend for that distance out on each side of the rod.

ROD WITH ANTENNAE





LOOKING STRAIGHT ALONG ROD

LOOKING ALONG ROD IN PERSPECTIVE.

Note.—Many other variations are possible in the positions of the cross wires

The two ends of the front coil are bent forward for about half-an-inch. This front coil acts as the main selector. When the points are in a vertical position in relation with the axis of the rod as held in the hand, the rod then reacts to electric (*sic*)

currents; when the points are horizontal it is for water; the intermediate angles give other reactions. The other two coils give variety according to their placing, and the way their points are bent.

A few days ago a man called upon me to whom I had given some general instruction quite a few years ago. In the course of conversation he asked me if I had found out anything more. I showed him one of these antenna rods and set it for various matters and influences. It worked correctly for him without his knowing what it was set for. He declared it to be "absolutely astounding." It also worked for a friend of his whom he had with him and who had not been able to work a rod before.

[It appears that the insulation on the antennae is not necessary, but it is useful in giving a grip on the rod.—ED.]

NOTES AND NEWS

The *Medical Times* of February contained a notice about the Society and remarks on Radiesthesis and its uses, mentioning Mr. Noel Macbeth's School of Instruction.

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The *Referee* (Sydney) of February 2nd contains an account of the finding of water by Mr. A. A. Cook (B.S.D.) on the Royal Queensland golf course at a depth of 350 feet where other dowsers had failed.

* * * * *

The Johannesburg *Star* of March 18th describes how water was found by Miss E. M Penrose (B.S.D.) on the property of of Mr. Lloyd Anderson at Illovo at a depth of 160 feet. She had first located a granite ridge which runs across the property by means of a sample. The borehole was yielding 1,800 gallons per hour.

* * * * *

As reported in the *Gloucestershire Echo* of March 25th and *Cheltenham Chronicle* of April 1st, Dr. F. C. Wallis, D.Sc., of the Bristol Museum, gave a lantern lecture to the Cheltenham Branch of the Geographical Association at St. Mary's College, Cheltenham, on March 24th, entitled "Water Supply: the Geologist versus the Water Diviner." A statement by the lecturer that the dowser had no physical basis to his work was contested by Mr. J. Cecil Maby (B.S.D.).

Writing in the *Illustrated Carpenter and Builder* of April 7th about windmill pumping and installations, Mr. G. Eric Mitchell, A.R.I.B.A., states that "the services of a water diviner are invaluable for determining a suitable position over a good underground supply of water."

* * * * *

As reported in the *Sunday Referee* of April 9th, and some seventeen other papers, Mrs. Barraclough (B.S.D.) made frequent references to dowsing in an address to the Astrologers' Convention at Harrogate at Easter.

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In the *Southern Daily Echo* of April 11th is recorded the funeral of Mr. Rodney Kitcher, of Sway, whose services as a water diviner "had extended to all parts of the country and to France."

CORRESPONDENCE

LES MANDARINIERS,
QUARTIER TRIANON,
ANTIBES, FRANCE.
17*th February*, 1939.

DEAR COLONEL BELL,

As the work of Frau von Knoblauch, described in her exceedingly interesting articles in the June and December issues of the Journal, may have within it possibilities of epochal importance, it seems desirable to assemble all the pertinent data available on this subject of the influence of earthrays on health. The following notes on matters connected with two local cases are, consequently, being sent to you in the hope that you may find them interesting enough to be given a place in the Journal.

The first is that of a friend who has recently suffered an acute attack of articular rheumatism in the shoulder. On testing his room, my associate, Max Bourcart, discovered the emanations of a subterranean artery that ran diagonally under his bed. Steps were at once taken to secure and place the asbestos insulation recommended by Frau von Knoblauch. While studying in the house, Bourcart hit upon the idea of seeing what effect a piece of fine-mesh chicken-wire that was being used in the place of a more conventional hearth screen might have upon his pendulum,

inasmuch as he had often observed in his field work that too close proximity to a wire fence robbed him of his sensitivity and prevented him from feeling anything. Laid on the floor with the concave side down, the netting insulated effectively his pendulum against the water radiations in the area corresponding exactly to the perpendicular lines ascending from the edges of the netting. When, however, the concave side was turned up, the influence spread out beyond the edges, following more or less the lines of their projections.

The size of the mesh in this chicken-wire was one centimeter. Securing a similar piece, both Bourcart and I tested it over a small water artery in our garden and then over another of gas and found that it effectually stalled both our pendulums and rods. Held directly over it, our pendulums remained entirely inactive, whereas the moment they were moved beyond the edges of it they immediately showed signs of life.

Wondering whether this property of insulation might be absent in a larger mesh, I tested a piece with a 6-centimeter opening, only to find identical results. When it was bent and laid on the ground with the concave side up, its influence extended beyond the perpendicular lines projected upward from the sides, just as had been the case with the fine-meshed piece.

These experiments tend toward establishing the fact that chicken-wire might prove as effective an insulation as the asbestos sheets and certainly warrant a further and more detailed study of the subject.

Another feature of my friend's case proved most intriguing. When he went to take a paraffin bath treatment at the Thermal Establishment on the Avenue Petit Juas in Cannes, he recounted to the Directress, Mme. Espaney, the discovery which Frau von Knoblauch had made and the fact that a subterranean artery had been found under his sleeping room. When he added that asbestos insulation had been placed under his bed, a deep memory stirred in his hearer's mind.

The treatment which is being given in this establishment was originally developed and put into practice by the late Dr. Barthe de Sandfort, the inventor of that wonderful composition "Ambine," which saved thousands of badly burned French and Allied soldiers during the war from what would otherwise have been excruciating pain and subsequent disfigurement and which brought him world-wide fame as the "Chef des Services de l'Ambrine et des Paraffines dans les Hôpitaux de la Guerre et de la Marine."

Having worked for years with Dr. de Sandfort, Madame Espaney told me, as I went yesterday to have the statement direct from her, that, while superintending a clinic for rheumatism in Dax, the doctor had decided that, if he could insulate the beds of his patients, he might secure better and quicker results.

"So," she continued, "he decided to put sheets of asbestos under them. He evidently did not know why, but," touching her forehead with her fingers, "it came to him as an inspiration from somewhere." And thus this intuitional genius used and approved through the favourable results he obtained the method which Frau von Knoblauch has now placed for us upon its scientific basis.

The second case is one which has occurred within our own household. Last spring my wife one day called Bourcart's attention to a dying daisy bush that stood at the end of a row of five or six vigorous ones, explaining to him that through several years the attempts to raise a bush at this end of the row had persistently failed. He immediately proffered the suggestion that there might be a natural gas artery so close to the surface as to affect the plant, as he had already on several occasions found this cause of plant deterioration in other gardens, as well as under certain trees that had died. In a few minutes he had felt and traced with his pendulum a narrow artery to directly under the sickly plant, where it rose very definitely and took off at an angle toward the garage.

When studying it under the garage floor, he found a second and larger vein of some fifteen or sixteen meters estimated depth, coming in from the north. Both of us tested this from time to time, until one day Bourcart found that the gas in the fissure had been supplanted by water, whose course we traced under our kitchen and the room of our maid to a distant pool some kilometer away to the northwest. There we let the matter rest.

During the autumn, while I was away from home, my wife wrote me that our Swiss maid had fallen victim to a most acute attack of rheumatism in her hands, back and feet, which rendered her almost helpless and threatened to force her to give up her work. She added that she had just read an article in the recently arrived December Journal, describing the work of a dowser in South Africa and exposing the theory that rheumatism might readily be caused by emanations from underground streams. This led her to suggest my testing the maid's room the moment I should be back.

Returning just before Christmas, I found our stream still running under the maid's room and that she had her bed placed exactly over it, as though it were done with fell intent. We at once moved it to a corner of the room, nailed on the asbestos boards and gave her a Lakhovsky necklace. Since then she has been given a respite from work for a fortnight and is making good progress toward recovery.

Naturally we do not know whether a complete cure will be wrought or not; but this is not the essential element to be studied in this case. The pertinent and striking fact is that she has lived in this same room for some eight or nine years and that she

first felt the rheumatism coming on in May and June last, which corresponds with the period when we noticed the gas in the artery had given away to the evidently superior water pressure. She said nothing of it at the time, and seemed to have fully recovered during her summer holiday at home in Switzerland. In the autumn the trouble recrudesced, and grew acute in the months of November and December.

Her case, I take it, must be explained away as one of those exceptional "coincidences," or else recorded as another possible striking bit of evidence of the operation of Frau von Knoblauch's theory. If observations such as these could be carefully accumulated and controlled to support her contention, it would seem a matter of the plainest humanitarian duty that her suggestion *re* investigating "every single house for the benefit of the common health of the town, as they do in many towns in Germany" should be put into force by the health services of every city and town throughout the "civilized" world.

Yours sincerely,

LEWIS S. PALEN.

* * * * *

80 GRANGE ROAD,
WEST HARTLEPOOL,
CO. DURHAM.

DEAR COLONEL BELL,

Perhaps the following account of an experiment in divining from a distance would be of interest.

In February, 1938, a barge on which were two ship's boilers, overturned and sank in Hartlepool Bay. On September 6th I happened to notice, from a navagation warning, that their position was still not known, and the thought came into my mind to see if I could locate them from the shore.

Using a piece of steel as a sample, I got three indications of the presence of steel out in the Bay. One point was particularly strong, evidently a large mass of metal, so I marked this spot on a map, and my estimate of depth was 47 feet.

I wrote to the owners of the boilers, offering to try to locate them, but they replied that they were no longer interested in their recovery, but the Harbour Commissioners probably would be.

I called at the office of the Commissioners. The Secretary told me that a large part of the Bay had been swept, and that a 10,000-ton iron vessel and also two minesweepers lay sunk in the Bay.

From the very strong pull, I thought I might have located on the big ship, whose depth they had found to be 48 feet. On an unmarked chart I marked the position with the pendulum, and when this was checked with the chart used to mark the areas of the sweeping operations, the point I had marked was directly over the wreck of the 10,000-ton vessel, whose measured depth was 48 feet; my estimate was 47 feet.

I was thus exactly right as to position, and only 12in. out in depth. As this wreck was easily the largest mass of metal in the Bay, one would expect the strongest pull at this point.

Two other points give indications of metal at 53 and 56 feet. Both give strong reactions, and a further point, giving a lighter pull at 60 feet, is most probably the lost boilers.

This experiment was carried out on shore and in the Commissioners' office, and, I think, is rather good for divining from a distance.

Yours faithfully,

J. A. CLARKE.

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TAUBSTUMMENGASSE 6,
VIENNA 50,

March 9th, 1939.

DEAR COLONEL BELL,

Allow me to make a few remarks on the excellent article "Rays and Emanations," by Captain F. L. M. Boothyby in your *Journal* of March, 1939.

I.—Also my iron rod is affected by short waves. I feel them also without a rod, if I am acted on by them for a longer time. But I think that most of the rays I feel are different from the rays known to physicists, who have neglected them hitherto, although they were produced by the radio apparatus at the same time as the short waves. The short waves and their unknown companions affect me very disagreeably. This reminds me of an article in the *Daily Mail* of May 15th, 1935, where it was stated that a strange illness was detected in experiments conducted by the United States Naval Research Laboratory. Workers placed in a powerful electric field of ultra short waves for a long time developed striking symptoms of physical derangement, such as a fall in blood pressure, persistent headache, dizziness and general lassitude and fatigue—in other words, they suffered from short wave intoxication. Dr. William Beaumont, honorary director of the Institute of Ray Therapy, stated to the Editor: "I can quite see the dangers that may arise when short waves are used for other than medical purposes. The

man who uses short-wave apparatus from a radio point of view is not concerned with their medical aspect, and may unknowingly lay himself open to possible danger."

A neighbour uses a radio apparatus which causes me similar disagreeable sensations as noted by the Naval Research Laboratory of U.S.A. I described my experiences with this neighbour in the *Zeitschrift für Wünschelrutenforschung* of April and June, 1936. Since then I have experienced similar sensations from radio apparatus in other cities. I suppose that other people also are affected by radio apparatus without knowing it.

I can find with my iron rod the direction wherefrom the waves come.

II.—I feel rays emitted by a feeble X-ray apparatus, as used in schools, with my iron rod, but it seems to me that they are not the X-rays known to the physicist. I don't feel them behind a paper painted with zinc sulphide or barium platinocyanide. The rays felt by me are reflected by the paper painted with zinc sulphide as are rays of light. Vicomte Henry de France and the professor of physics at the University of Vienna, Dr. Eduard Haschek, found that rays from feeble X-rays apparatus are felt by dowsers. Meanwhile, the physician, Dr. Eduard Aigner, the physicist, Dr. August Wendler, and the geologist, Baron Rudolf von Maltzahn, could not perceive any action of X-rays on dowsers, probably because they used too strong apparatus. Therefore it seems that rays acting on dowsers are emitted only by feeble X-rays apparatus and are different from the known X-rays.

III.—Dr. August Wendler has stated that the rays of a subterranean watercurrent are reflected by a glass mirror and are then felt by his dowser. My experience is that rays of a subterranean watercurrent are also reflected by a simple glass plate. I may add that some of the rays felt by me are very slow, and seem to consist of corpuscles having a movement as waves and forming the phenomenon of interference.

Very truly yours,

DR. RAOUL BRAUN-FERNWALD.

REVIEWS

RADIESTHESIE PHYSIQUE.

By Pierre Béasse.

In his most interesting book *Radiesthésie Physique*, Monsieur Béasse deals with what he considers is the most important part of Radiesthesia. He points out that Radiesthesia is not contained in one word but in a succession of three principle facts.

1. The Objective Fact or *fait* physical or biological.
2. The Subjective Fact of a physiological nature.
3. The Psychic.

and of the three he considers the "Physical Fact" to be the most important.

Talking of rays he says the rays of Matter are the most interesting, and these he describes as polarised electro-magnetic waves. These waves, which are found in the organism of most animals and insects, permitting them to feel and discriminate, operate also in the nervous system of man. But, with the exception of ultra-sensitive subjects, the action is little felt by the majority of human beings, who only become conscious of it by means of an amplifier, which might be compared to the accoustical apparatus employed by a deaf person, the amplifier in this case being a rod or pendulum, which may be either active or neuter.

Monsieur Béasse points out that whether working on Physical or the Psycho-physical, *i.e.*, near at hand or at a distance, the phenomenal objectives used in *Radiesthésie* are always the same —their nature being sometimes electric, magnetic or radio-active —and have nothing mysterious about them. He explains that the rays of animate or inanimate matter appear in the form of electro-magnetic short waves of low intensity in which the physical properties are at all points analogous to the polarised rays of light, or to the wireless waves.

In Chapter III. he describes the Fundamental Ray among other rays peculiar to certain simple bodies, and touches on some unusual phenomena of a micro-physical nature such as light, the elimination of images and the phenomena of impregnation, &c.

Among many other subjects he refers to prospection on the ground for water, minerals, oils and cavities, &c., and touches on the subject of *Téléradiesthésie*, the working on plans, elimination of disturbing influences, and the rays of living persons, animals, vegetation and disease.

His book is a complete treatise of Radiesthesia which deserves to be translated into English, although no doubt some passages will lead to much controversy.

G.DE B.

August, 1938.—This number opens with a welcome from Herr Alfred Kurz, the leader of the Austrian dowsers, and the articles are, in the main, devoted to Austrian subjects as a prelude to the Congress which was held at Krems from the 17th to the 20th September of last year.

Dr. Lukas Waagen, of Vienna, gives a brief account of the mineral resources of Austria, Herr Hans Falkinger recounts some of his memories as a dowser in the same country, and Herr Alfred Kurz contributes some pages in praise of the artistic and historic interest of the journey through Wachau from Krems.

The number concludes with the only article that deals with dowsing proper, a short note by Dr. Gerhart Isert upon the need for propaganda for dowsing, giving what he considers to be the main lines on which to work for such propaganda.

September-October, 1938.—Dr. Franz Wetzel writes a note in praise of the success of the congress at Krems. He mentions by name the most outstanding personalities, and gives a brief statement of the subjects on which they spoke.

Followed Dr. Paul Beyer's paper, read at the Congress, entitled "Dowsing practice and the demands of the times." As he intended to restrict himself to practical economic subjects, he touched only on the original field of the dowser, *i.e.*, prospecting for geological phenomena, and he avoided entirely the biological and medical side of the question. He described the difficulties and the danger of drawing too definite conclusions from uncontrolled and unchecked dowsing ("whoever credits his successes as a dowser as 100 per cent. is either inexperienced or dishonourable and undiscerning"). He is doubtful about methods which profess to detect depth and quantity of desposits ("In most cases such results have shown themselves to be erratic, and practically impossible in regions which are not known geologically").

He seems to think that there are points in favour of prospecting for oil with the rod: he states that in any case there are only five per cent. successes, even when careful geological and geophysical investigations have been carried out. He suggests that if the dowser is used as well as these latter methods a notably higher percentage of successes could be obtained.

Dr. Schreiber contributes a paper on the "psychology of the diviner's rod." He starts with the statement that "the encounters of the dowsers with official science during recent years have led to the widespread opinion that the rod motions must be caused by purely psychical reactions: and that, in consequence, there can be no question of a purely physical cause for the stimulus." This is to say that the common view held by those who do not believe in dowsing is that the reaction is purely due to an impulse from the imagination, and that it has no physical basis. In

geological investigations, for instance, the investigator subconsciously decides upon the phenomenon at hand, and, as a result, produces the required reaction. Similarly, in medical dowsing, it is said that a subconscious diagnosis is previously made. On the other hand, the dowser says that the reactions are produced where no diagnosis can be made, and that frequently only local reactions are obtained, which must be then and there interpreted in the form of a diagnosis.

The Verband admits that mistakes are made in dowsing, but maintains that such mistakes are no greater in number than those in other sciences, and that its object is to find out the cause of these errors. The author of the paper knows, of course, that some results are unreliable, as they are purely due to subconscious impulses. While admitting this, however, he disagrees with the opponents of dowsing, who state that all these impulses are endogenic, and he maintains that many of them are exogenic.

November, 1938.—Dr. Volker Fritsch writes on the analogy between dowsing investigation and electrical prospecting. He reminds readers of the numerous unsuccessful attempts to connect the dowsing phenomenon with known rays—" If, however, we bring together the results of this work we are forced to the conclusion that the existence of some other rays is certainly possible, but is by no means proved." He proceeds to draw parallels between the position of " geopathogenic " zones and those of underground electro-geological discontinuity, and he suggests a plan for the investigation side by side of the two subjects.

Dr. Franz Wetzel continues his account of the proceedings of the congress, and mentions a lively argument between certain official oil geologists and dowsers for oil. The former were apparently very scornful, and the latter inclined to resent remarks which they took as personal. After the atmosphere had cleared a little Dr. Beyer remarked that it would be difficult to compare dowsing and geological results until at least as many borings had been made after dowsing as had been the case after geological predictions. In fact, he seems to have carried the war into the enemy's camp (" Until this is done, in fact, all opinions contrary to dowsing are vague theory ").

During this sitting Dr. Wendler gave a brief account of four years' work with the double compass. He is convinced of the efficacy of this instrument in giving objective results which will stand official tests.

Herr Schulrat Manthey writes upon dowsing and archæology, and gives a short account of the discovery of the foundations of a neolithic hut.

Dr. Braun Fernwald reviews French dowsing publications. He also refers to dowsing in Italy and America, and in connection with dowsing in the former country he mentions correspondence

with Cav. Alberto de Vita with regard to oil prospecting carried out with the help of his geovoltometer.

The professional committee gives twelve rules for practical dowsers. The Verband will have nothing to do with dowsing from maps (rule 3), and restricts all disease investigations either for men or for animals to the proper medical practitioners (rule 7).

Dr. O. reviews a new book on geology written in a popular manner. He recommends this book (*Die Ruhelose Erde*—R. Gheyselinck—im deutschen Verlag, Berlin). He says that it will give reliable information of geological phenomena to those who have not made a study of the subject, and points out the necessity of a knowledge of geology to all students of dowsing.

December, 1938.—Dr. Franz Wetzel writes on "bioelectric currents in the brain and the dowsing phenomena." He mentions Galvani's view that electric currents flowed in the surface of the brain. From this he passes to a brief account of the results obtained by various later workers in the investigation of currents and rhythms produced in the brain by different stimuli. He thinks that this work is of great importance in the study of dowsing.

Herr Baumeister writes a brief note, giving a summary of his conclusions after seven years' observations in connection with lightning conductors in a high tension system. He recommends the use of the diviner's rod for finding a proper earth for lightning conductors.

Dr. O. brings an account of an interesting investigation. A boring was to be made in the neighbourhood of some mineral springs, and from the legal standpoint, as well as for other reasons, it was essential that these springs should not be tapped. This problem was successfully solved by the dowser employed.

Dr. W. writes a note on the great importance of the proper understanding and development of hydraulic schemes in Germany.

Dr. B. writes a tribute to the memory of the late Treasurer, Herr Ingenieur Nikolaus Kremer, and the number ends with a few reviews and official notices.

END OF VOLUME III

SOME BOOKS ON DOWSING AND HUMAN RADIATION

The Divining Rod, by Sir William Barrett and Theodore Besterman (out of print).

Water Divining, by Theodore Besterman ; Methuen, 7/6.

Water Diviners and their Methods, by H. Mager (translation) : Bell, 16/-.

The Modern Dowser, by Le Vicomte Henry de France (translation) : 2nd Edition, Bell, 4/6.

The Art of Water Finding, by M. E. Pogson : obtainable from the President, B.S.D., post free, 1/8.

Local Variations in a Penetrating Radiation and their Connection with Water Divining, by H. M. Budgett : obtainable from the President, B.S.D., -/6.

The Human Atmosphere (the Aura), by W. J. Kilner : Kegan Paul.

The Origin and Properties of the Human Aura, by Oscar Bagnall : Kegan Paul.

Les Sourciers et leurs Procédés, by H. Mager.

Traité complet des secrets de la Baguette et de la Pendule des Sourciers, by Frère Padey, 65 fr.

Le Sourcier Moderne, by Henry de France, 5th Edition, 10 fr.

Comment j'opère, by Abbé Mermet, 4th and enlarged edition, 25 fr.

La Radiesthésie (explaining Abbé Bouly's method), by M. A. Capron, 15 fr.

Comment devenir Sourcier, by Armand Viré, 18 fr.

Tu Seras Sourcier, by Emile Christophe, 20 fr.

Manuel théorique et pratique de Radiesthésie, by René Lacroix-à-l'Henri : Henri Dangles, 38 rue de Moscou, Paris (8e), 20 fr.

La Radio-Tellurie, by M. Larvaron and Dr. J. Regnault : Maison Deyrolle, 46 rue du Bac, Paris, 18 fr.

Essai sur les Rayonnements de l'Homme et des Etres vivants, by C. Voillaume.

Cours de Radiesthésie, by Henri Lemonnier : Maison de la Radiesthésie, 16 rue Saint-Roch, Paris.

La Vérité sur la Radiesthésie, by Paul Serres : Dunod, Paris.

Le Pendule Magique, by Madame de Mersseman ; Maison de la Radiesthésie, Paris, 15 fr.

Electricité Magnétisme Radiesthésie, by Comte de Marsay : Maison de la Radiestnésie, Paris, 12 fr.

Radiesthésie Physique, by Pierre Béasse.

Investigación de aguas subterraneas, by Bartolomé Darder Pericás.

Handbuch der Wünschelrute, by Carl Graf von Klinckowstroem and Rudolf Freiherr von Maltzahn.

Die Wünschelrute, by Hans Falkinger.